ABSTRACT

A method of producing a porous flow field material for a bipolar separator plate is provided. The method includes bonding a single layer of wire mesh or bonding together at least two layers of wire mesh to form a porous flow field material, wherein the bonding is achieved by diffusion bonding, continuous resistance welding, continuous sintering, or a combination thereof. Such porous flow filed materials may function as, for example, fluid flow fields, current collectors, gas distribution layers, and/or coolant layers. A method of producing a bipolar separator plate including such porous flow field materials is also provided, wherein the component layers are bonded together by diffusion bonding, continuous resistance welding, continuous sintering, or a combination thereof, thereby forming a bipolar separator plate.